

DRAFT Attachment H-WRD 10.06
Hazard Analysis Guidelines for Combined Risk Factors
Department of Labor and Industries
WISHA Services Division

This document will assist inspectors in reviewing work sites where caution zone jobs have been identified. The inspector does not have to evaluate every job, but can use the following strategy for representative sampling. Inspectors will use Appendix B of the rule (WAC 296-62-05174) to evaluate whether there are hazard zone jobs. However, the employer has the option to use an analysis tool other than Appendix B. Some acceptable methods of alternate analysis are identified with each risk factor; in cases where the employer is relying upon either a listed alternative or another alternative, the inspector will need to request that an ergonomist assist them in these inspections.

This appendix contains the following sections to assist inspectors in making their determinations:

- Typical clues to recognize Combined Risk Factors
- Typical jobs where the hazard zone jobs for Combined Risk Factors are found.
- Tips on measuring Combined Risk Factors
- Acceptable methods of hazard analysis when using the general approach
- Typical solutions
- Common questions for Combined Risk Factors
- There is no caution zone criterion for the Combined Risk Factors.

The hazard zone criteria for Combined Risk Factors per Appendix B (WAC 296-62-05174) are:

- High Hand Force (Pinching-gripping) highly repetitive motion and awkward wrist postures meet hazard zone criteria when they are combined and total 3 or more hours per day.
- Intensive Keying and awkward wrist postures meet hazard zone criteria when they are combined and total more than 4 hours per day.

Typical clues to recognize combined risk factors: Combinations of hand force (pinching-gripping), repetition and awkward wrist postures

Risk factors such as high hand force, highly repetitive motion and awkward postures of the wrist often are combined on the same task. Combined exposures are common when using hand tools and hand-held power tools, or when repetitively handling heavy objects.

Typical clues to recognize combined risk factors: Combination of intensive keying and awkward wrist postures

Awkward wrist postures occur along with intensive keying when the keyboard is too high, too low or excessively tilted, or when using a standard keyboard with the elbows out to the side. Look for creases in the wrist where it is bent, awkward reaching with the pinky or thumb to reach certain keys.

Typical jobs where Combined Risk Factors CZJ/HZJ risk factors are found:

Risk Factors	Typical Jobs
Hand force, repetition and awkward wrist postures	<ul style="list-style-type: none"> • Mechanics • Construction workers • Assembly line workers • Lumber handlers in a sawmill • Meat cutters • Welders
Intensive keying and awkward wrist postures	<ul style="list-style-type: none"> • Medical or legal transcription • Data entry • Word processing • Court reporter • Accountants or bookkeepers using the 10-key

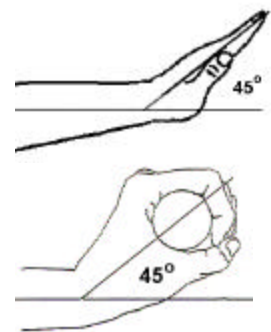
Tips on measuring Combined Risk Factors that are suspected to be hazard level:

- There is no need to look for combinations of risk factors at the caution zone level. Caution zone risk factors should always be evaluated separately.
- For the hazard analysis, it's important to look at all of the possible combinations for high hand force, repetitive motions, intensive keying and awkward wrist postures to see which grouping best represents the work being done. Depending on the particular combination, the allowable duration varies:

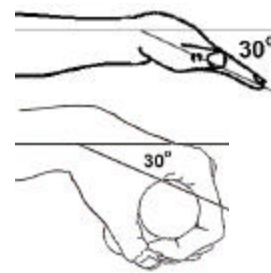
Risk Factor(s)	Duration
Intensive keying only	7 hours
Highly repetitive motion only	6 hours
High hand force only	4 hours
Intensive keying and awkward wrist posture	4 hours
Repetition and hand force	3 hours
Hand force and awkward wrist posture	3 hours
Repetition, hand force and awkward wrist posture	2 hours

- The only awkward posture that is a concern in combinations of risk factors is bent wrists. This risk factor is not a consideration at the caution zone level. Wrists must be bent beyond 45 degrees of extension, 30 degrees of flexion, and 30 degrees of ulnar deviation to be considered awkward (see illustrations).

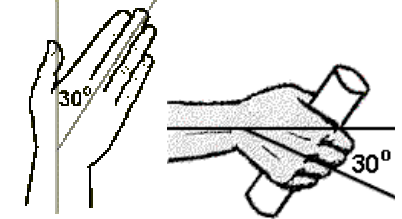
Bending the wrist Extension



A. Flexion



Ulnar deviation (bent towards the little finger)



- Highly repetitive motion combined with awkward wrist posture is not one of the categories. Unless there is hand force involved repetitive motions of the hands and wrists into awkward postures should be treated as repetitive motions with no other risk factors. When hand force is involved, these awkward wrist motions become much more damaging, and this is why the allowable duration for these three risk factors combined is 2 hours.
- Only consider risk factors as combined when they are occurring simultaneously on the same task. The duration of exposure when assessing combined risk factors is the amount of time when more than one risk factor is present, not the duration of the most prevalent risk factor. For example, a worker is pruning trees, which requires repetitive motions, but only uses high hand force to cut the thickest branches. The duration for repetition alone is the duration of the whole task of pruning (minus any breaks in hand movements), but the duration of repetition combined with hand force is only the amount of time spent cutting the thicker branches.

Acceptable methods of hazard analysis for Combined Risk Factors (acknowledged in the general performance approach within the rule):

- ACGIH Hand Activity Level (HAL) Threshold Limit Value (TLV)
- Job Strain Index
- UAW-GM Risk Factor Checklist

It is acceptable for an employer to have used any of these methods to assess combinations of risk factors for the job in question. The inspector or consultant` will need to ask for the results of the assessments. Contact the ergonomists at Policy & Technical Services for assistance. Inspectors do not need to know how to do these assessments nor how to interpret them.

Typical Solutions for Combined Risk Factors:

- It may be possible to address only one of the combined risk factors in order to reduce exposure below the hazard level. Sometimes, it is best to address the worst of the risk factors. Often, it will be obvious that one of the risk factors is the worst, e.g., a lot of hand force is being used, or there is a very high rate of repetition. In other cases, it may help to ask employees which of the risk factors causes the most discomfort.
- There may be cases where the easiest one to fix may be the logical one to address.
- Any solution that resolves more than one risk factor should be given first consideration, especially if other factors are equivalent.

****See solutions charts for each individual risk factor to find possible solutions.**

Commonly asked questions for Combined Risk Factors:

(1) How can employers determine when different repetitive motion tasks are additive, i.e. worker rotates between two tasks that are repetitive but are different jobs. Is the time additive, or could there be situations where the tasks differ enough that it wouldn't be additive?

The important test here is the similarity of motions being made, especially in terms of the body part being used. For example, repetitive reaching involving the shoulders would be additive if it was required of two jobs. If one job could reduce reach distances so that the shoulder was noticeably less involved, in other words most of the reaching was limited to forearm movement, then it would not be additive. In many cases, however, hand intensive jobs will be additive, since grasping motions are common to these jobs, even if a lot of the other motions are different.